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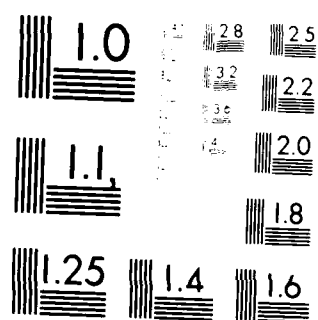
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**DAVID W. TAYLOR NAVAL SHIP
RESEARCH AND DEVELOPMENT CENTER**

Bethesda, Maryland 20084



COMPUTER CENTER
INTRODUCTORY REFERENCE MANUAL
FOR CDC 6000

by

David V. Sommer

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Computation, Mathematics and Logistics Department
Departmental Report

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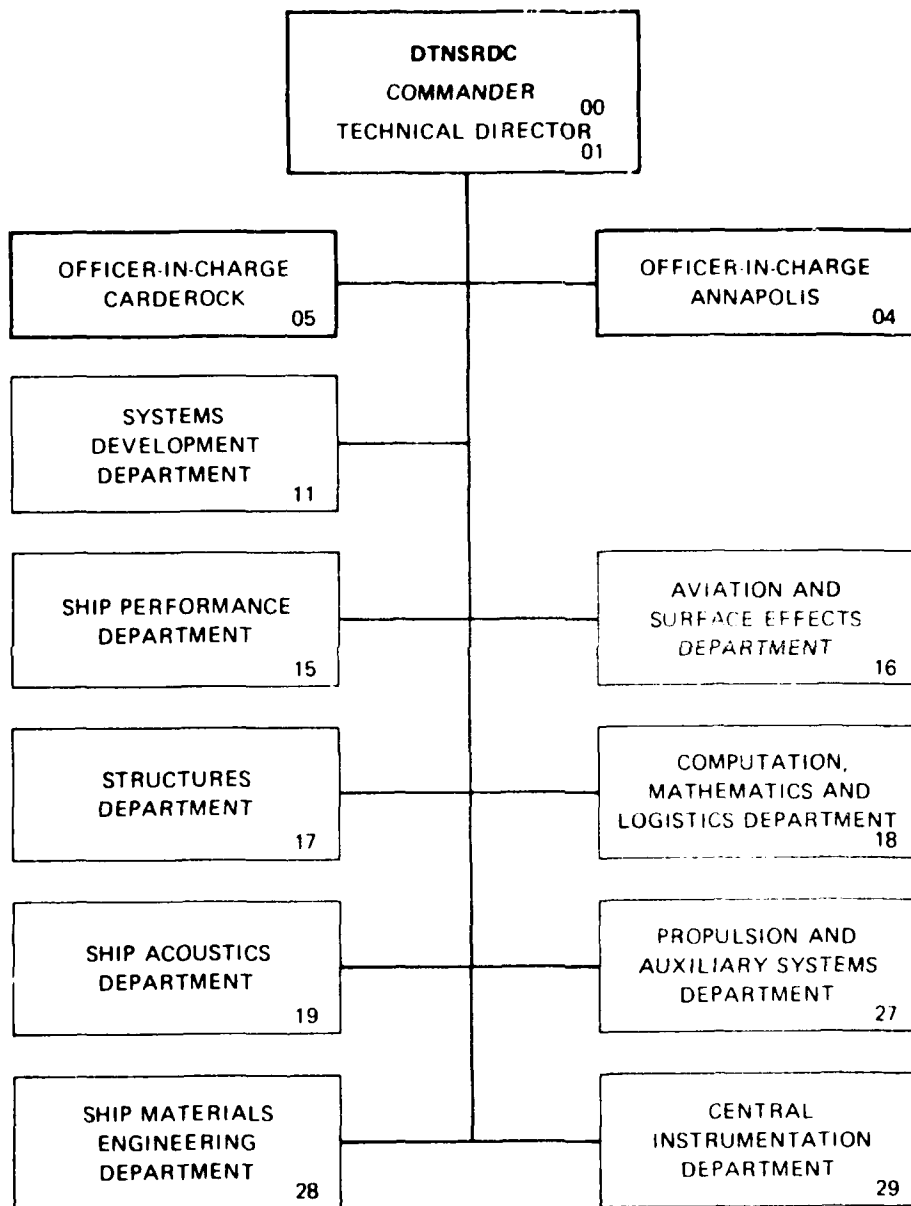
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Computer Center Introductory Reference Manual for CDC 6000

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MAJOR DTNSRDC ORGANIZATIONAL COMPONENTS



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 Bethesda, Maryland 20084

Computer Center
 Introductory Reference Manual
 for CDC 6000

by
 David V Sommer
 User Services Branch

Code 1892

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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Computer Center Introductory Reference Manual provides an introduction to the CDC 6000 NOS/BE Operating System for new users. Some information has been distilled from many individual documents and reflects usage at DTNSRDC. Control card examples and descriptions of some software are included. | | |

Table of Contents

| | |
|--|-----|
| Preface | |
| Glossary | ii |
| | |
| 1 Introduction | |
| Files | 1-1 |
| Examples | 1-2 |
| | |
| 2 Batch Jobs | |
| Control Card Record | 2-1 |
| Job Output | 2-1 |
| Job Card | 2-2 |
| CHARGE Card | 2-3 |
| Some NDS/BE Control Cards | 2-3 |
| Error Messages | 2-7 |
| Examples | 2-8 |
| | |
| 3 Intercom | |
| Accessing Intercom (LOGIN) | 3-1 |
| Leaving Intercom (LOGOUT) | 3-1 |
| Some Intercom Commands | 3-2 |
| Correcting and Interrupting | 3-4 |
| Editor | 3-4 |
| Examples | 3-7 |
| | |
| 4 Other Features | |
| User Source and Object Program Libraries | 4-1 |
| Computer Center Libraries | 4-1 |
| Other Software | 4-1 |
| Graphics | 4-1 |
| Alternate Output Forms | 4-1 |
| | |
| 5 User Help | |
| Computer Status Phone | 5-1 |
| User Trouble Form | 5-1 |
| Training | 5-1 |

*** Glossary ***

The following terms are mentioned in this report:

Access number

Each account number (job order number) is assigned an access number which is used on the batch CHARGE card (see 2-3) and Intercom LOGIN (see 3-1).

Alphanumeric

A letter (a-z) or a digit (0-9). Also called alphanumeric.

Catalogued procedure

A previously-defined sequence of control statements for performing a task. A catalogued procedure is executed using the BEGIN control statement.

CLIR

Used throughout this manual to refer to "Computer Center CDC Libraries", CMLD-81-06.

CCRM

Used throughout this manual to refer to the "Computer Center CDC Reference Manual", CMLD-81-21.
(See 2-10: Example 8)

CDC 6000

Used to refer to any or all of the four CDC computers at QINSROC: 6700, 6600, Cyber 74, Cyber 176. These computers are also referred to by their mainframe letters: MFA (6700), MFB (6600), MFD (Cyber 74), MFF (Cyber 176).

Control card record

The first group of cards in a batch job, ending with a card having 7/8/9 multi-punched in column 1. These are all the control cards to be processed during the job. Any additional records, such as a source program or data, follow the control card record.

Dayfile, batch

As a batch job is being run, a permanent record of the job activity is created. This is called the dayfile, a copy of which is printed at the end of each batch job. The dayfile includes a list of all control cards executed, any system- or program-generated messages and a summary of the system usage including the estimated basic charge. This charge does not include card reading/punching or line printing. (See POLICY for the current rates.) Each message has the time-of-day it was written.

Dayfile, Intercom

As commands are executed during an Intercom session, messages are generated similar to those in batch. They are collected and printed at the terminal, usually at the end of each command, though some may be printed during the execution of a command. Except for LOGOUT (see 3-1), the dayfile messages are not time-stamped.

Field Length (FL)

The amount of memory occupied by a program. Addresses in a program are relative to the start of the field length, called the reference address (RA). A program occupies from RA+0 thru RA+FL-1. Thus a user never needs to know the actual location of the program in memory.

POLICY

Used throughout this manual to refer to "Computer Center Policy" manual.

User initials

(also called user-id or usercode). The 4-character ID assigned to each user by Code 189.3. This is used to identify jobs, for charge authorization, to identify permanent files and magnetic tapes, etc.

***** Introduction *****

DTNSRDC has four CDC computer systems: the 6700, 6600, Cyber 74, and Cyber 176. The operating system on each is the Network Operating System/Batch Environment, version 1 (NOS/BE 1). NOS/BE has two major subsystems:

- 1) the batch system for processing jobs submitted at central site, through remote batch terminals or from interactive terminals;
- 2) the time-sharing system, called Intercom, which supports teletypes and other interactive terminals.

DTNSRDC has a fifth CDC computer, a Cyber 170 model 750 (MFE), which supports the Mass Storage System; It uses the NOS operating system and its files are accessed from the other CDC computers via seven NOS/BE control statements. (See "Computer Center Mass Storage System User's Guide" (CMLD-82-19) and CCRM, 3-36 ff).

This Introductory Reference Manual is designed to provide the new user with enough information to run simple batch jobs and to create and run programs and batch jobs interactively. Some of the most frequently used control statements are described. Magnetic tapes and user-owned device sets (disks) are not discussed. No attempt is made to describe all features of the operating system or even all parameters of the control cards presented. More information can be found in the companion publications "Computer Center CDC Reference Manual" (CCRM), "Computer Center CDC Libraries" (CLIB), "Computer Center Policy" (POLICY).

Before using the system, job order number(s) to be charged must be registered and an access number obtained. Outside users must transfer funds to DTNSRDC before receiving a job order number. The access number is used only on the batch CHARGE card (see 2-3) and the Intercom LOGIN (see 3-1). At all other times the job order number is used. Each individual user should have 4-character user initials assigned. Code 189.3, (202) 227-1910, handles the items discussed in this paragraph.

The Cyber 74 is a secure system used to process jobs for classified projects. Special registration is required.

*** Files ***

The CDC 6000 is a file-oriented system. A file is a collection of related records treated as a unit. It may reside on disk, magnetic tape, cards, printer output. Files may be temporary or permanent. Temporary files exist for all or part of a job or Intercom session; permanent files are added to the system by the user and remain until removed by the user or until removed for lack of use (see 2-3: AUDIT).

Permanent files are identified to the system by a permanent file name (pfn) having 1-40 alphanumeric characters (letters and/or digits) and an ID (the 4-character user initials), both supplied by the user. Permanent files may be accessed by either of the NOS/BE subsystems. Some permanent files may be accessed by several jobs simultaneously.

There are three sets of permanent files: one is shared by the 6700 and 6600 and may be accessed by either machine; the second is for the Cyber 74; the third is for the Cyber 176. Permanent files may be transferred among or shared by all CDC computers using the Mass Storage System.

During a batch job or interactive session, all files, whether temporary or permanent, must have a unique means of identification. This is called the local file name (lfn) which begins with a letter and contains 1-7 alphanumeric characters. The lfn is defined in one of many ways:

- 1) ATTACHing a permanent file (in this case the lfn may be the same as the permanent file name (pfn));
- 2) executing control statements (such as COPYE, FTN5, REQUEST, REWIND) which operate on files;
- 3) executing a user program;
- 4) saving a file in one of the editors (Intercom).

Once defined, the lfn remains until end-of-job or end-of-session unless released by commands such as RETURN, ROUTE, DISCARD (see 2-6, 3-2).

Several lfn's have special meaning in batch jobs. Some of these are:

INPUT - batch card deck
 OUTPUT - printer output
 PUNCH - coded punched card output (BCD)
 PUNCHB - binary punched card output

Examples

The following illustrate both stated and implied local file names for some typical control cards:

| command | local file names | | |
|-----------------------------------|------------------|------------|---------------|
| COPYSE, INPUT, OUTPUT. | INPUT | OUTPUT | |
| FTN5. | INPUT | OUTPUT | L60 (see 2-5) |
| REQUEST, MYFILE, *PF. | MYFILE | | |
| ATTACH, MYPROG, PROGRAM, ID=xxxx. | MYPROG | | |
| ATTACH, UTILITY. | UTILITY | (also pfn) | |
| RETURN, A, B, C. | A | B | C |

***** Batch Jobs *****

A batch job consists of one or more records (which are called logical records and are separated by end-of-records (EOR)). The job is terminated by an end-of-information (EOI). If the batch job is a card deck, the EOR is a card with 7/8/9 multi-punched in column 1 and is represented by ' in the examples; the EOI is a (green) card with 6/7/8/9 multi-punched in column 1 and is represented by " in the examples.

The first/only record contains all the control statements for the job. Each statement invokes a program to perform the required task (e.g., 'REWIND,....' to rewind files; 'FTN5,....' to compile a Fortran program; 'LGO.' to execute a compiled program).

Any additional records contain data for the programs executed in the control statement record (e.g., source program for FTN5 compiler, data for a user program).

Some characters have different punches in 026 (BCD) and 029 (ASCII) mode. The most frequently used ones are '(', ')', '=', '+'. All cards in the logical record must be punched in the same mode (all 026 or all 029). A change of mode is indicated by '26' or '29' in columns 79-80 of the EOR card preceding the record. The mode of the control card record is indicated in columns 79-80 of the job card (omitted=026). Some remote terminals (COC 200 user terminal (200-UT)) require that all cards in a job be in one mode. See 2-9: Example 6.

At the end of this chapter are several examples illustrating some typical batch jobs.

*** Control Card Record ***

The first card of each job is the job card; next is the CHARGE card. The remaining control cards depend upon the tasks to be performed.

A control card contains a program name or command followed by zero or more parameters, separated by commas, and enclosed in parentheses (or comma..period):

```
PROG.  
PROG(param1,param2,....paramn)  
PROG,param1,param2,....paramn.
```

The control card record ends with an EOR card.

*** Job Output ***

Listable output is normally written onto file OUTPUT. When printed, it will consist of one or two banner pages containing the NOS/BE job name (see description of job card below). Next is one page with the system status (which gives important information to the user (it is updated frequently)). Then follow the pages of user output: compilation listings, loader maps, user program output, etc. Last is the dayfile (see glossary).

*** Job Card ***

The job card identifies the job and defines core and time requirements and run priority. For additional parameters, see CCRM, 2-3.

Job card requirements vary among installations. At DTNSRDC, the following must be observed:

6700/6600 - blue (Carderock)
yellow stripe (Annapolis)
Cyber 74 - red
Cyber 176 - orange

No other cards in a deck may be of these colors.

The job card has the form:

| | | |
|----------------------------|-----------|----|
| jobname,CMnnnnnn,Pn,Innnn. | code/name | kn |
|----------------------------|-----------|----|

jobname is the job name. It identifies the job. To insure uniqueness among jobs, NOS/RE will alter the 5th and 7th characters. This NOS/RE job name (jobna**) will appear on the banner page of the output. The job name has the form: xxxxyyy, where
xxxx are the user initials (assigned by Code 189.3)
yyy may be any letters or digits or omitted.

CMnnnnnn is the maximum (octal) memory the job will require, if greater than the default of 47200.
(max: 377777 (Cyber 176) or 300000 (others))

Pn is the job priority. It may be one of the following:
P4 - express
P3 - regular (default)
P2 - deferred (normally overnight)
P0 - block time (run only at pre-scheduled times)
emergency - by special written request only, see POLICY
charges increase for greater priority (P2 has the lowest charge).
(See POLICY for CM, time, tape and user device set combinations for P3, P4.)

Innnn is the time limit for the job in decimal seconds (at Cyber 176 cpu rate for MFF; at 6400 cpu rate for others).
(default: 180 seconds; maximum: 32766)

code/name are comments.

kn columns 79-80. If control cards are punched in 029 mode, enter '29'; if 026 mode, enter '26' or leave blank.

If only the jobname is specified, the default job card is:

jobname, CMA7200, P3, T180.

26

Some user sites have different forms of the job name and code/name comments. Contact your local User Services group.

*** CHARGE Card ***

The second card must be a CHARGE card which has the following format:

CHARGE, xxxx, accessnbr.

xxxx are the user initials.

accessnbr is the access number corresponding to the job order number for charging this job.

*** Some NDS/BE Control Cards ***

The following are some of the most frequently used control cards (listed alphabetically). Where appropriate, there is a reference to similar or related cards. Additional parameters for many of these control cards may be found in CCRM.

ATTACH, lfn, pfn, ID=xxxx, <parameters>.

ATTACH, lfn, ID=xxxx, <parameters>.

Make a previously cataloged file available for use by this job. Many parameters, including cycle number and passwords, are available (see CCRM, 3-5,6). Pfn is a 1- to 40-character permanent file name. If pfn is omitted, lfn is also pfn. (see CATALOG/PURGE)

AUDIT.

List all files cataloged by user-id xxxx (where xxxx is taken from the CHARGE card). The user should check the 'last att' (last attach) column frequently. Files which have not been used for 30 days or more are purged by the Computer Center and retained on magnetic tape for an additional 30 days.

For a sorted audit, use: BEGIN, AUDIT.

BEGIN, <parameters>.

Execute a (catalogued) procedure. See CCRM, 7-18, for a discussion of catalogued procedures.

CATALOG,lfn,pfn,ID=xxxx,<parameters>.

CATALOG,lfn,ID=xxxx,<parameters>.

Save a file after it has been written. It can then be attached in a later job. Pfn is a 1- to 40-character permanent file name. If pfn is omitted, lfn is also pfn. (see ATTACH/PURGE)

COROL5,<parameters>.

Execute the Cobol 5 compiler. Some parameters are:

R=lfnbm - binary object program will be on file lfnbm
(default: R=LGO)

I=lfnin - the source program is on file lfnin
(default: I=INPUT)

L=lfnout - the listings will be on file lfnout
(default: L=OUTPUT)

(for cross references, use LO=M/R)

See CORM, 5-15, for additional parameters.

Note: CORIL5 requires at least CM65000 on the job card.

COMMENT. Add comments to the control card record. They are printed in the dayfile.

COPYF,lfnin,lfnout.

Make an exact copy of lfnin. Both lfnin and lfnout must be specified.

COPYF,lfnin,lfnout,n.

COPYR,lfnin,lfnout,n.

Copy n files or records (default: 1) from lfnin to lfnout. Both lfnin and lfnout must be specified.

COPYSF,lfnin,lfnout,n.

COPYSR,lfnin,lfnout,n.

Single space listing of n files or records (default: 1). Useful for listing files which do not have carriage control in column 1, such as source programs. (Defaults for lfnin,lfnout are INPUT,OUTPUT.)

DMP,ffffff,llllll.

DMP,llllll.

Dump from relative octal address fffffff thru llllll. If fffffff is omitted, 0 is implied. Will stop at current fl.

EXIT.

When a program ends abnormally, no more control cards are executed unless there is an EXIT card. Then control continues with the first card following the 'EXIT.' card. For example,

EXIT.

DMP(47200)

FTNS,<parameters>.

Compile Fortran 77 program(s). Some parameters are:

- B=lfnb** - binary object program will be on file lfnb
(default: B=LGO)
- I=lfni** - the source program is on file lfni
(default: I=INPUT)
- L=lfno** - put listings on file lfno
(default: L=OUTPUT)
- OPT=0** - Optimization level, may be:
 - OPT=0** - no optimization (fast compile,
slow execute) (default)
 - OPT=1** - partial optimization (slow compile
fast execute)
- LO=** - Cross reference list of variables and
statements, etc. May be:
 - LO=A** - list of variables, common blocks and
attributes
 - LO=M** - address map
 - LO=R** - cross-Reference MapTo combine, separate values with a slash
(LO=A/M/R).

See CCRM, 4-33-36, for additional parameters.

LDSET,LIB=libname.

Libname is the lfn of an attached library of commonly used (sub)programs. When loading a user program, the loader will search the specified library for routines the program needs. LDSET applies only to the next load. See 2-9: Example 4.

NAME.

Load and execute lfn NAME (may be attached permanent file). E.g., ATTACH,MYPROG,ID=xxxx.
MYPROG.

PURGE,lfn,pfn,ID=xxxx,<parameters>.**PURGE,lfn,ID=xxxx,<parameters>.**

Remove a file from the system. Pfn is a 1- to 40-character permanent file name. If pfn is omitted, lfn is also pfn. If lfn is a file which has already been attached (see CCRM, 3-7), only lfn is required. The file remains local until released by the user or until end-of-job.

(see ATTACH/CATALOG)

REQUEST,lfn,*PF.

File lfn is to be put onto permanent file space. Must be used before creating a file to be cataloged.

REQUEST,lfn,*Q.

File lfn is to be put onto queue space. Used before creating a file to be routed. (see ROUTE)

RETURN,lfn1,lfn2,...,lfnn.

Return one or more files to the system.

REWIND,lfn1,lfn2,...,lfnn.

Position each file at its beginning.

ROUTE,lfn,<parameters>.

Route file lfn according to specified/implied parameters, which may include:

| | |
|-----------|---|
| DC=PR | - route to printer (default for OUTPUT) |
| DC=PU | - route to punch (default for PUNCH/PUNCHH) |
| DC=SC | - scratch the file (default for most others) |
| DEF | - defer routing until end-of-job |
| TID | - return file to job origin |
| TID=C | - route lfn to central site |
| TID=<tid> | - route lfn to terminal with id of <tid> |
| FC=<fc> | - forms code (central site only) for printed/punched output. For example, IT - narrow, unlined paper HH - 3-hole-punched reduced xerox output (see CCRM, 2-9 for additional codes) |

Note: After routing, lfn does not exist, unless it is a permanent file.

*** Error Messages ***

If there are any errors in execution, messages will appear in the dayfile. In addition, error messages may appear in compilation listings, loader maps and program output. Fatal errors will cause a short dump to be printed on file OUTPUT.

Frequent program error messages include:

ARITHMETIC ERROR MODE=01 ADDRESS = nnnnnn

ERROR MODE=01. ADDRESS = nnnnnn

Address out of range. Usually a subscript error. If the first digit of the indicated address is ≥ 4 , check the dayfile or loader map for missing subprogram(s).

ARITHMETIC ERROR MODE=02 ADDRESS = nnnnnn

ERROR MODE=02. ADDRESS = nnnnnn

Program tried to use an infinite (e.g., division by 0). This error does not occur when the infinite value was created, only when it is used in computation.

ARITHMETIC ERROR MODE=04 ADDRESS = nnnnnn

ERROR MODE=04. ADDRESS = nnnnnn

Program tried to use an indefinite (e.g., 0 divided by 0). This error does not occur when the indefinite value was created, only when it is used in computation. It may also indicate a variable which was never defined.

Other errors are described in CCRM, 2-21, Chapters 4 and 5.

*** Examples ***

1. Compile and execute a program. If program runs, catalog binary object program to eliminate recompilation.

```
Jobname.                                name/code
CHARGE,xxxx,accessnbr.
REQUEST,LGO,*PF.
FTNS.                                ** or COROL5. (CM65000 on job card)
LGO.
CATALOG,LGO,MYOBJ,ID=xxxx.
* 7/8/9 eor
  (source program)
* 7/8/9 eor
  (data cards)
* 6/7/8/9 eof
```

2. Execute a previously cataloged binary object program.

```
Jobname.                                name/code
CHARGE,xxxx,accessnbr.
ATTACH,MYOBJ,ID=xxxx.
MYOBJ.
* 7/8/9 eor
  (data cards)
* 6/7/8/9 eof
```

3. Compile and execute. If job runs, route output to 1700 terminal '011', dayfile to originating terminal. If job aborts, all printout goes to originating terminal (ROUTE card will not be executed).

```
Jobname.                                name/code
CHARGE,xxxx,accessnbr.
FTNS.
LGO.
ROUTE,OUTPUT,DC=PR,TID=011.
* 7/8/9 eor
  (Fortran program)
* 7/8/9 eor
  (data cards)
* 6/7/8/9 eof
```

4. Compile and execute a program which uses subroutine(s) from library 'NSRDC'.

```

jobname.                                name/code
CHARGE,xxxx,accessnbr.
FTN5.                                ** or COROL5. (CM65000 on job card)
ATTACH,NSRDC.                          ** make library available to the loader
LDSET,LIB=NSRDC.
LGO.
  * 7/8/9      eor
    (source program)
  * 7/8/9      eor
    (data cards)
  * 6/7/8/9    eof

```

5. Read and catalog a deck of cards (may be source program for later interactive use, data cards, etc.).

```

jobname.                                name/code
CHARGE,xxxx,accessnbr.
REQUEST,DATA,*PF.
COPYR,INPUT,DATA.
CATALOG,DATA,DATAXYZ,I'=xxxx.
  * 7/8/9      eor
    (cards to be cataloged)
  * 6/7/8/9    eof

```

6. Illustrate control card record punched in 029 mode, next 2 records in 026 mode, last record in 029 mode.

```

jobname.                                name/code
CHARGE,xxxx,accessnbr.
  (rest of control cards in 029 mode)
  * 7/8/9      eor
    (cards in 026 mode)
  * 7/8/9      eor
    (cards in 026 mode)
  * 7/8/9      eor
    (cards in 029 mode)
  * 6/7/8/9    eof

```

This method works only at central site and at 1700 remote batch terminals. From 200-UI-compatible terminals, the entire deck must be in the same mode (all 029 or all 026) and the proper switch must be set or the proper emulator loaded.

7. Audit user's files.

```
jobname.                                name/code
CHARGE,xxxx,accessnbr.
AUDIT.                                ** List files with ID=xxxx
* 6/7/8/9 eof
```

8. Print one copy of the Computer Center Reference Manual (CCRM) on narrow paper at central site.

```
jobname.                                name/code
CHARGE,xxxx,accessnbr.
BEGIN,MANUAL,,CCRM.
ROUTE,OUTPUT,DC=PR,TIO=C,FC=1T.
* 6/7/8/9 eof
```

***** Intercom *****

Intercom is the NOS/BE interactive system. Through it, the user can execute almost all control statements. By the use of an editor, programs can be created and executed. Batch jobs may also be created and sent to the system for processing.

Intercom is more expensive than batch, but the turnaround is almost immediate. With careful planning, more work can be accomplished in less time.

The special file names (lfn's) listed on 1-2 are just file names in Intercom. If INPUT and OUTPUT are to be interactive at the terminal, they must be connected (see 3-2: CONNECT).

All user entries must be followed by carriage return. It has been omitted from most illustrations in this chapter.

Before using Intercom, user initials and access numbers must be registered with Code 189.3. (Registration for batch use does not automatically include Intercom.)

*** Accessing Intercom ***
(LOGIN)

Intercom supports teletypes, CRTs and other teletype-equivalents at 10, 30 or 120 characters per second. After connecting with the computer:

- a) Enter carriage return within 30 seconds.
- b) The computer will respond with a time and date greeting, after which enter LOGIN.
- c) In response to "ENTER USER ID-" , enter your Intercom ID in the form xxxxxxxxxx .
- d) In response to "XXXXXXXXXX ENTER ACCESS NUMBER" , enter your access number in the blackened out space.
- e) When the computer responds with COMMAND-, enter any valid NOS/BE or Intercom command.

See 3-7: Example 1 for a typical login sequence.

A user-defined turnkey password is available to protect against unauthorized use by others (see CCRM, 9-2). When defined, it will be requested after step d) above.

*** Leaving Intercom ***
(LOGOUT)

To terminate the Intercom session, enter LOGOUT . The computer will give some statistics about the session, ending with:

mm/dd/yy LOGGED OUT AT hh.mm.ss.

<

The user should then hang up the phone to complete the session.

*** Some Intercom Commands ***

In addition to most NOS/BE commands (see Chapter 2), several Intercom commands are available. Commands need not be ended with a terminator (period or right parenthesis) as Intercom will supply one. Additional parameters for many of these commands may be found in CCRM, Chapter 9.

AUDIT Intercom audit (see 2-3)

For a sorted audit, use BEGIN,AUDIT.

BATCH,lfn,LOCAL

Move a file from the terminal's output queue to a local file. It can then be PAGED and/or ROUTED to a printer.

CONNECT,lfn1,lfn2,...

Connect files to the terminal. Input and output are routed to and from the terminal when the named files are read or written. In effect, the file names are equated to the terminal. (see DISCONT)

DISCARD,lfn

DISCARD,lfn,xxxx

Same as PURGE,lfn,ID=xxxx.

RETURN,lfn.

If xxxx is omitted, it is taken from LOGIN.

If lfn is a local file, omit xxxx.

(see FETCH/STORE)

DISCONT,lfn1,lfn2,...

Disconnect files from the terminal. The file names are no longer equated to the terminal. (see CONNECT)

EDITOR

Program to create/modify files (described below).

FETCH,lfn

FETCH,lfn,xxxx

Same as ATTACH,lfn,ID=xxxx.

(see DISCARD/STORE)

FILES

List local, input, executing and output files.

If local file is preceded by *, it is an attached pf.

If local file is preceded by t, it is connected to the terminal. (see CONNECT/DISCONT)

J,jbn

jbn is first 1-7 characters of a jobname. For all queues on the 6600 and 6700, list all jobs beginning with these characters. Used to follow a job through the system.

J,jbn,x

Same as Q,jbn,x, except check both 6600 and 6700 (if executed on the 6600/6700); x may also be

S - special queues (plot, etc.)

MYQ,TOT,ALL

List number of jobs in input, execute, output, punch, special and Janus (central site) queues.

ATTACH,NETED.

NETED,lfn. An alternative text editor. (see 3-4: footnote)

PAGE Scan a file. See CCRM, 9-17 for PAGE commands.

Q List number of jobs in input, execute, output, punch and Janus (central site) queues.

Q,jbn jbn is first 3-7 characters of a jobname. For all queues, list all jobs beginning with these characters. Used to follow a job through the system. When jbn reaches the terminal's output queue, it may be BATCHed local and PAGED and/or ROUTED to a printer.

Q,jbn,x Check for jbn in a specified queue. 'x' is one of:
A - all queues (list of job name(s) only)
E - execute queue
I - input queue
J - Janus (central site reader/printer/punch)
O - output queue
P - punch queue
Except for A, statistics are given for the job(s) listed. (see J command)

ROUTE,lfn,DC=IN**ROUTE,lfn,DC=IN,TID=xxx**

Initiate a batch job from Intercom.

lfn - file containing a complete batch job (control cards in first record)

DC=IN - route the file to the input queue.

xxx - is one of:

omitted - this terminal

C - central site

3-character terminal id of a 1700, 200-UI-type or another teletype.

Output will go to that terminal.

See 3-9: Example 7.

SEND,xxxxxxxx

Send messages to another terminal. xxxxxxxx is the 1- to 10-character user id (see SITUATE). End messages with a separate entry of END. For example,

SEND,USERSERVIC

PLEASE CALL 555-1234 TO HELP USER

EDITOR PROBLEMS WITH PERM FILE

END

SITUATE List all currently logged in users. An asterisk before indicates the user cannot receive messages.

STORE,lfn**STORE,lfn,xxxx**

Same as CATALOG,lfn,ID=xxxx.

(see DISCARD/FETCH)

REQ,... Load and/or execute a program requiring more than one loader control card. (see CCRM, 9-15)

*** Correcting and Interrupting ***

- %a** Abort the current command. If the Intercom terminal is typing, the esc key, the interrupt key, or (sometimes) any other character, must be entered first to interrupt the printing. Then enter the percent key, followed by the letter a, followed by carriage return. No other character may appear in the line.
- ctrl-h**
BS To delete the character just entered, use the backspace key, or hold the ctrl key while typing letter 'h'. Repeating will remove more characters, but never more than the complete line. On some terminals, the carriage/cursor will not move.
- ctrl-x** To delete the line being entered, hold the ctrl key while typing letter 'x'. Repeating will have no additional effect. On most terminals, the carriage/cursor will not move.

*** EDITOR ***

EDITOR (*) is a program for creating and modifying source programs and data files. Lines are numbered either by the user or EDITOR. Tabs are provided for easy spacing of information.

EDITOR commands are summarized below. Most commands and parameters may be abbreviated by the first character (see examples 4, 6, 7).

BYE Exit EDITOR. Edit file and format information are retained. If the edit file has not been saved, an error message will be typed. The user should then save the file and enter BYE again.

CREATE
CREATE,SUP
CREATE,n1,n2,SUP

Clear current contents of edit file and begin creation of a new edit file starting with line number n1 (default: 100), incrementing by n2 (default: 10). Use SUP to suppress line number prompting.

When all lines have been entered, end with = (followed by carriage return).

(*) NETED is a faster, cheaper editor supported by the Computer Center. The NETED document can be obtained by:
BEGIN,DOCGET,,OTHER,,NSRDC,OUTPUT.
The output file may be routed to print on narrow paper (e.g., see 2-10: Example 8).

DELETE,ALL Delete all lines.

DELETE,n1

DELETE,n1,n2

DELETE,n1,n2,<string>/

Delete line n1 or lines n1 thru n2, inclusive. If n1 is LAST and n2 is omitted, delete last line. If n2 is LAST, delete from line n1 thru last line. If specified, only those lines with matching character string will be deleted.

EDIT,lfn

EDIT,lfn,SEQ

Bring existing local file lfn into edit file and add line numbers (start with 100, increment by 10). If SEQ is omitted, lfn already contains EDITOR sequencing. If one or more lines in lfn exceeds the current line length, a message is typed by EDITOR. A user response of Y or YES will continue editing, truncating all long lines. Any other response will terminate the edit command. If SEQ is omitted and lfn does not have EDITOR sequencing, an error message will be typed by EDITOR.

FORMAT,FTN

FORMAT,FORTRAN

FORMAT,COBOL

FORMAT,BASIC

Change formatting (default: FORMAT,FORTRAN)

Certain predefined settings are provided (for these, the tab character is ;):

F,FTN5 - FTN5 (ch=72, tabs at 7,10,13,16,19)

F,F - Fortran (ch=72, tabs at columns 7,10,13,16,19)

F,COB - Cobol (ch=72, tabs at 8,12,16,20,24)

F,B - Basic (ch=999, no tabs - required for entering and running BASIC programs)

FORMAT,SHOW Type the current values of ch, tab character and the tab settings.

LIST List current line. If SUP specified, do not list line number.

LIST,ALL

LIST,ALL,SUP

LIST,ALL,<string>/

LIST,n1

LIST,n1,n2

LIST,n1,n2,<string>/

List lines. Parameters are as described above.

n1=<text> (Re)define line n1. Until another, different command is entered, no further prompting is given. See 3-8: Example 4.

RUN,BASIC or RUN,BASIC,NOEX
RUN,COBOL or RUN,COBOL,NOEX
RUN,FTN or RUN,FTN,NOEX
RUN,FTNS or RUN,FTNS,NOEX

Compile Basic/Cobol/Fortran program (lfn OUTPUT is connected automatically). If NOEX is omitted and there are no errors, load and execute the program (lfn INPUT and OUTPUT are connected automatically). Note that EDITOR does not support RUN,COBOL5.

SAVE,lfn,NOSEQ,OVERWRITE

Put edit file into local file lfn with/without sequencing. If overwrite is specified, current local file lfn is replaced (overwritten) by the current edit file (permanent files may not be overwritten). lfn is rewound before and after the SAVE. Note that the file is not cataloged. Use STORE or CATALOG to make the file permanent.

/<string1>/=/<string2>/,n1,n2,(<cols>)

/<string1>/=/<string2>/,n1,n2,(<cols>),UNIT

Change all occurrences of <string1> to <string2> in line range specified. N1, n2, (<cols>) are as described above. <string1> is 1-20 characters; <string2> is 0-20 characters. String delimiters may be / or any character other than blank, comma, parenthesis, equal, letter or digit. If UNIT is specified, <string1> must have a non-alphameric character on both sides of the string to be recognized. See 3-8: Example 4.

*EOF

When encountered as text during SAVE, will generate a system end-of-file.

*FOR

When encountered as text during SAVE, will generate a system end-of-record. A typical use is between job control and data when creating a batch job.

*** Examples ***

1. LOGIN/LOGOUT (underlined items are to be entered by the user).
<cr> is the carriage return. All user entries must end with <cr>.

Dial the computer << 227-4700 for 1200/300 baud on Cyber 176
<< 227-3000 for 1200/300 baud on 6000

<cr> << to establish the baud rate (1200 or 300)

NSRDC MFF INTERCOM 4.7 << Cyber 176

DATE mm/dd/yy

TIME hh.mm.ss.

LOGIN

ENTER USER ID-xxxxxxxxxx

XXXXXXXXXX ENTER ACCESS NUMBER

accessnmbr (entered in blackened out space on previous line)

(Terminal id and system bulletin will be typed, followed by:)

COMMAND- (LOGIN is complete. Enter commands)

LOGOUT

(several lines of session statistics are typed)

2. Create, execute and catalog Fortran program. (System-produced printing has been omitted in this and later examples. Phrases starting with ** are just comments and are not to be entered by the user.)

EDITOR

CREATE

** set automatic line number generation

;PROGRAM TEST2 (INPUT=128, OUTPUT=128, TAPE5=INPUT)

C AUTHOR AND ADDRESS

C USES LIST-DIRECTED I/O (COMMA-SEPARATED, UNFORMATTED DATA)

;CALL CONNED (5)

;PRINT *, 'TYPE IN A, K, H -'

2;READ (5, *, END=10) A, K, B

;IF (A.EQ. 0.) STOP

;C = A ** K + B

;PRINT *, A, K, B, C

4;FORMAT (1X, F7.2, '***', I3, ' + ', F7.2, ' = ', (15.7)

;GO TO 2

10;STOP

;END

-

** terminate create command

LIST,ALL

** list for proofreading

SAVE,MYPROG

** make local file

RUN,FTN

** compile and execute (if no errors)

BYE

** leave EDITOR

STORE,MYPROG

** catalog for later use

3. Create and execute Basic program.

```

EDITOR
DELETE,ALL                ** clear edit file
FORMAT,BASIC              ** establish basic editing format
100 REM COMPUTE AND PRINT
110 REM AUTHOR AND ADDRESS
120 LET P = 3.14159267
130 PRINT " ENTER X";
140 INPUT X
150 IF X<=0 THEN 200
160 LET W = SQR(P * X)
170 PRINT " ROOT IS"
180 GO TO 130
200 END
RUN,BASIC                  ** compile and execute

```

4. A Fortran program was cataloged previously. Add a PROGRAM statement, make a few modifications, catalog the new source code and execute the revised program.

```

ATTACH,OLDPROG,ID=XXXX    ** make permanent file a local file
EDITOR
EDIT,OLDPROG,SEQ          ** sequence the deck for editing
90=;PROGRAM TEST (INPUT=128, OUT=128)
/SIN=/COS/,A,U            ** text replacement, change sin to cos
/OUT/= /OUTPUT/,90        ** correct file name in program card
),210,220                 ** delete lines
L,A                        ** list for proofreading
S,NEWPROG                  ** make local file
RUN,FTNS                   ** compile and execute revised program
RYE                         ** leave EDITOR
STORE,NEWPROG              ** catalog corrected program

```

5. Compile and execute a program which requires an external file.

```

EDITOR
...                         ** create or edit user program
RUN,F,N                     ** compile without load or execute
RYE                          ** leave EDITOR
ATTACH,NSRDC                 ** get needed library
XEQ,LDSET,LIB=NSRDC,LOAD=LGO ** load and execute

```

6. Audit user files.

```

CONNECT,OUTPUT
AUDIT

```

7. Create a batch job (needed because the execution core requirement prohibits running on Intercom).

```

EDITOR
C,S                ** suppress line number generation
xxxxBIG,CM66000.
CHARGE,xxxx,accessnbr.
ATTACH,BIGPROG,ID=xxxx.
BIGPROG.
*FOR
    2    15    7
10.      15.
20.
346.2
=
L,A            ** terminate create command
S,JOB,N        ** list for proofreading
BYF            ** save without sequencing
STORE,JOB      ** leave EDITOR
ROUTE,JOB,DC=IN,TID=C  ** catalog file
                        ** put into central site input queue

J,xxxxR        ** follow progress of job, if desired

```

***** Other Features *****

*** User Source and Object Program Libraries ***

NOS/BE has utilities for maintaining source programs and data (UPDATE) and object routines (EDITLIB) in libraries. See CCRM, Chapter 7.

*** Computer Center Libraries ***

Many libraries of programs and subprograms are maintained by the Computer Center. CCRM, Chapter 10, and CLIB describe their contents and use. Many procedures (pre-defined sets of control cards for performing standard tasks) are also available (see CCRM, Chapter 7, and CLIB).

*** Other Software ***

Several additional compilers, translators and other software systems are available, among them: Abaqus, Algol, API, Checkpoint, Compass, DCL/Query Update, DMS170, GPSS, Nastran, Pert, Simscript, Snoplot, Sort/Merge, SPSS, System 2000, and text processors. See CCRM, Chapter 11.

*** Graphics ***

Graphics software packages are available for the Calcomp and Tektronix plotters and plotting terminals.

*** Alternate Output Forms ***

Large output files may be printed on the Xerox-1200 reducing printer (reduced to 8-1/2 x 11) (see CCRM, 12-18) or microfiche (see CCRM, 12-9).

***** User Help *****

Consultation is available from the User Services Branch:

Carderock: bldg 17, room 100 (202) 227-1907

Annapolis: bldg 100, room 1A (301) 267-3343

*** Computer Status Phone ***

For a recorded message on the status of the CDC computers, call (202) 227-3043.

*** User Trouble Form ***

A User Trouble Form is used for refund requests, problems, suggestions, gripes, etc. Gripes or other comments may be entered directly into the computer from Intercom by entering BEGIN,GRIFE. There is prompting for all information.

*** Training ***

Several classes (Fortran, Cobol, Operating System, etc.) are offered periodically by the User Services Branch. Call User Services for current information.

The statement

BEGIN,DOCGET,,CLASS,,A,OUTPUT.

may be used to obtain the current list of possible classes including dates for those which are scheduled.

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